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## METABOLIC CHANGES IN PATIENTS WITH TYPE 2 DIABETES AND SECONDARY INSULIN RESISTANCE

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**Purpose:** The purpose of this work is to study the features of laboratory indicators in patients with type 2 diabetes who received insulin therapy depending on the insulin dose.

**Methods & Materials:** Seventy three patients of both sexes were examined and treated in the endocrinology department of the municipal clinical hospital. Patients age ranged- 45 to 70 years old. Depending on the dose of insulin (within physiological need or higher) patients were divided into 2 groups. Patients in the first group (45 people) were treated with insulin dose  $\leq 40$  U/day; the second group (28 people) received insulin  $>40$  U/day. During the examination of patients, special attention was paid to study the following parameters: the current age of the patient and the age at the beginning of the disease, duration of type 2 diabetes, body mass index (BMI). The determination of fasting and postprandial glycemia, glycated hemoglobin (HbA1c) were included in glycemic control. Laboratory parameters like cholesterol, high-density lipoproteins (HDL), low-density lipoproteins (LDL), very-low-density lipoproteins (VLDL), triglycerides, atherogenic index, crude protein, level of creatinine and urea, transaminases; insulin level and C-peptide have been analyzed.

**Results:** Parameters of the average age of patients in both groups had slight difference ( $61.2 \pm 3.9$  and  $62.3 \pm 4.5$  years), at the beginning of the manifestation of type 2 diabetes, patients from second group ( $48 \pm 4.4$  years) were significantly younger than patients of the first group –  $54.6 \pm 2.1$  years. Patients in second group were more likely to have obese (BMI= $34.8 \pm 3.2$  kg/m<sup>2</sup>) than patients in first group (BMI= $28.8 \pm 2.8$  kg/m<sup>2</sup>), which partially explains the higher need for exogenous insulin. No significant differences

were found between groups according to the daily glycemic control criteria. Patients in group 1 had higher rates of pre-prandial glycemia than in group 2 – postprandial glycemia. Level of HbA1c in patients of the first group is –  $8.23 \pm 0.6\%$ , in second group is –  $9.92 \pm 0.4\%$ . There were no significant differences in mean values of patients of different groups in the structure of lipid profile. Patients of the second group, in which tendency to enhanced atherogenic index has been observed. The values of cholesterol-HDL, VLDL and triglycerides were higher in patients with a total daily dose of insulin  $\leq 40$  U/day. Remnant of insulin secretion remained unchanged in both groups. C-peptide level in group 1 was  $1.41 \pm 0.13$ , was  $0.93 \pm 0.21$  ng/ml in second group (at reference values  $0.78-1.89$  ng/ml). The correlation (Spearman Rank Order Correlations) of the HbA1c index with the C-peptide level was more significant ( $r = -0.39$ ,  $p < 0.01$ ) than the correlation of this indicator with the dose of insulin ( $r = -0.17$ ,  $p < 0.05$ ).

**Conclusion:** The risk factors of secondary insulin resistance in patients with type 2 diabetes include: the duration of the disease more than 10 years, BMI over 34 kg/m<sup>2</sup> and the age to the manifestation of diabetes below 50 years.

### Biography

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